DOES THE «ISLAND OF STABILITY» EXISTS?

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In the work [1], basing on experimental data for nuclear mass in the region of mass number $5 \leq A \leq 257$, values of Francini-Radicati factor R were calculated. These calculations allowed to estimate the bounds of realization of Wigner's spin-isospin $SU(4)$-symmetry in atomic nuclei. On the basis of Wigner's mass formula for the factor R, developed the expression which depend on isospin and takes into account odd-even fluctuation of the mass and therefore describes distribution of nuclei into three groups of Wigner's kind. The analysis of calculated values of R factor using Student's t-criteria allowed to state that the violated Wigner's spin-isospin $SU(4)$-symmetry restored only for nuclei with odd A mass numbers, isospin $T_z \geq 53/2$ and the level of significance $\alpha < 0.01$. The obtained data justify that the Wigner's symmetry is not restored in real and artificial even-even nuclei and especially in odd-odd nuclei however general tendency of restoration also visible.

A number of experimental facts justify restoration of Wigner's spin-isospin $SU(4)$-symmetry in the region of super-heavy nuclei: 1) asymptotic convergence of Gamov-Teller Resonance and Analogue Resonance in the region of heavy nuclei [3, 4]; 2) decrease of experimental values of the energy of spin-orbit interaction for nuclei with number of neutrons $N > 146$ up to ~100 KeV [5]; 3) results of statistical analysis applying Student's t-criteria that evidencing about restoration of $SU(4)$-symmetry for the nuclei with odd A mass number and isospin $T_z \geq 53/2$ [1]; 4) visible tendency of restoration of Wigner's symmetry for nuclei with even A in line with the growth of isospin T_z [1]. Wigner's symmetry restored due to elimination of spin-orbit splitting. The hypothesis of the «stability island» is not justified because it assumed significant spin-orbit splitting in this region.

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